

# SPECIFICATIONS:

## GENERAL

- INTENT OF PROJECT IS FOR NEW MATERIALS AND COMPONENTS TO MATCH EXISTING. ALL MATERIALS SHALL BE APPROVED BY MERCY HOSPITAL.
- REVIEW PROTOCOL AND PROCEDURES WITH MERCY HOSPITAL PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING BUILDING OWNER'S PROTOCOL AND PROCEDURES BY ITS EMPLOYEES AND SUB-CONTRACTORS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS IN THE FIELD PRIOR TO ANY DEMOLITION OR NEW INSTALLATION.
- ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE INTERNATIONAL BUILDING CODE AND ANY AND ALL OTHER APPLICABLE FEDERAL, STATE, AND LOCAL ORDINANCES.
- THE CONTRACTOR SHALL VERIFY SHUTDOWN AND ISOLATION VALVE LOCATIONS. THE CONTRACTOR SHALL COORDINATE ALL SHUTDOWN WORK WITH THE PROJECT COORDINATOR FOR MERCY HOSPITAL.
- THE CONTRACTOR SHALL VISIT THE SITE, BECOME FAMILIAR WITH THE EXISTING FIELD CONDITIONS, AND MAKE HIS OWN ESTIMATE OF THE DIFFICULTIES IN EXECUTING THE WORK PRIOR TO SUBMITTING ITS BID. NO COMPENSATION WILL BE AWARDED TO THE CONTRACTOR BASED ON A CLAIM OF LACK OF KNOWLEDGE OF EXISTING FIELD CONDITIONS.
- PIPING, DUCTWORK AND EQUIPMENT ARE NOT COMPLETELY DETAILED ON THE DIAGRAMS AND ELEVATIONS PROVIDED ON THE DRAWINGS ARE APPROXIMATE. THE DISTRIBUTION IS INTENDED AS A GENERAL ROUTING ONLY, BUT DOES ILLUSTRATE THE DESIRED LOCATION. THE CONTRACTOR SHALL AVOID INTERFERENCES WITH OTHER EQUIPMENT AND THE WORK OF OTHER DISCIPLINES.
- NOT ALL VALVES, INSTRUMENTS AND CONTROLS ARE SHOWN IN THE PLAN VIEWS. INSTALL PIPING AND VALVES AS SHOWN ON PIPING DIAGRAMS AND DETAILS.
- DUCTWORK, PIPING AND SUPPORTS SHALL NOT INTERFERE WITH EQUIPMENT MAINTENANCE ACCESS OR PULL SPACE.
- DRAWINGS OF REVISED DUCTWORK OR PIPING ARRANGEMENTS SHALL BE SUBMITTED IF ITEMS ARE NOT SHOWN ON THE DRAWINGS. REVISIONS SHALL BE SUBJECT TO REVIEW AND APPROVAL BY THE ENGINEER PRIOR TO COMMENCEMENT OF THE CHANGES.
- MECHANICAL CONTRACTOR SHALL PROVIDE ALL SUPPLEMENTARY STRUCTURAL SUPPORTS, ANGLE IRON, PLATES, ROD, ETC. AS NECESSARY FOR PROPER INSTALLATION OF PIPING, EQUIPMENT, AND ACCESSORIES.
- CONTRACTOR SHALL BE RESPONSIBLE FOR SIZING SUPPORTS, STRUT RACKS, TRAPEZE STEEL, PIPE SUPPORT COMPONENTS, ETC.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL DAMAGE MADE BY ITS FIRM ON NEW OR EXISTING EQUIPMENT INSTALLED OR RELOCATED BY HIM UNDER THIS CONTRACT. THIS SHALL INCLUDE ALL TOUCH-UP PAINTING.
- THE CONTRACTOR SHALL RETURN AS-BUILT DRAWINGS TO OWNER.
- CONTRACTOR TO PROVIDE ALL MATERIALS NEEDED FOR CONSTRUCTION UNLESS OTHERWISE NOTED OR DIRECTED.
- DIELECTRIC UNIONS SHALL BE INSTALLED BETWEEN DISSIMILAR METALS IN SOLDERED AND THREADED PIPING SYSTEMS AND INSULATED FLANGES FOR WELDING SYSTEMS.
- CONTRACTOR TO LABEL ALL NEW PIPING AND DUCTWORK EVERY 10 FEET. LABELING TO INCLUDE DIRECTION OF FLOW AS WELL AS DESCRIPTION OF CONTENTS. LABELING SHALL BE COLOR/SIZE ACCORDING TO OSHA SPECIFICATIONS.
- PRIOR TO CONNECTING TO ANY EXISTING PIPING, CONFIRM TIE-IN LOCATIONS WITH MERCY HOSPITAL PROJECT MANAGER.
  - PROVIDE HANGERS, SUPPORTS, AND INSERTS CONFORMING TO:
    - MSS SP-68
    - MSS SP-69
    - ANSI B31.9
  - PROVIDE PIPE HANGERS, SUPPORTS, AND ACCESSORIES WHICH:
    - PERMIT VERTICAL ADJUSTMENT AFTER INSTALLATION OF PIPING.
    - ARE DESIGNED FOR SUPPORT OF PIPING AND CONTENTS UNDER ALL CONDITIONS OF OPERATION INCLUDING TESTING.
    - WILL NOT CRUSH, INDENT, OR OTHERWISE DAMAGE PIPE, PIPE INSULATION, OR JACKETING.
  - PROVIDE COMPLETE HANGER AND SUPPORT ASSEMBLIES, INCLUDING CLAMPS, RODS, WASHERS, NUTS, TURNBUCKLES, AND LOCKING DEVICES, CONSTRUCTED FOR COMPATIBILITY WITH ITEMS SUPPORTED AND SUPPORTING STRUCTURE.
  - PROVIDE ALL SIMILAR SUPPORT COMPONENTS BY SAME MANUFACTURER.
  - PROVIDE OVERSIZED CLEVIS AND/OR ROLLER HANGERS TO FIT ON OUTSIDE OF INSULATED PIPING.
  - PROVIDE INSULATION PROTECTORS AT SUPPORT POINTS FOR ALL INSULATED UNJACKETED PIPING.
  - SPECIAL REQUIREMENTS: ALL COMPONENTS SHALL BE SUITABLY SIZED FOR THE LOAD SUPPORTED.
- CONTROLS, BALANCING AND CERTIFICATION:
  - CONTROLS CONTRACTOR SHALL PROVIDE CONTROL DEVICES AND MATERIALS.
  - CONTROLS CONTRACTOR SHALL PROVIDE AND INSTALL ALL REQUIRED DEVICES AND SENSORS, AND PERFORM TIE-INS TO EXISTING FACILITY SYSTEM.

## SUBMITTALS

- PRODUCT DATA: SUBMIT MANUFACTURERS PRODUCT DATA AND INSTALLATION INSTRUCTIONS FOR EACH MATERIAL AND PRODUCT USED.
- OPERATION AND MAINTENANCE DATA: SUBMIT MANUFACTURERS OPERATION AND MAINTENANCE DATA, INCLUDING OPERATION INSTRUCTIONS, LIST OF SPARE PARTS AND MAINTENANCE SCHEDULE.

## OPERATION AND MAINTENANCE DATA

- COMMENCE PREPARATION OF THE OPERATING AND MAINTENANCE (O&M) MANUALS IMMEDIATELY UPON RECEIPT OF "APPROVED" OR "APPROVED AS NOTED" SHOP DRAWINGS AND SUBMIT EACH SECTION WITHIN ONE MONTH. THE FINAL SUBMISSION SHALL BE NO LATER THAN TWO MONTHS PRIOR TO THE PROJECTED DATE OF SUBSTANTIAL COMPLETION OF THE PROJECT.
- THE MANUAL SHALL CONSIST OF (3) SETS OF MANUALS AND INCLUDE (3) SETS OF ODS, WHICH SHALL CONTAIN THE SCANNED CONTENT OF THE ENTIRE MANUAL. THE MANUAL SHALL HIGHLIGHT THE ACTUAL EQUIPMENT USED AND NOT BE A MASTER CATALOG OF ALL SIMILAR PRODUCTS OF THE MANUFACTURER.

## WARRANTIES

- SUBMIT MANUFACTURER'S STANDARD REPLACEMENT WARRANTIES FOR MATERIAL AND EQUIPMENT FURNISHED UNDER THIS SECTION. SUCH WARRANTIES SHALL BE IN ADDITION TO AND NOT IN LIEU OF ALL LIABILITIES WHICH THE MANUFACTURER AND THE HVAC SUBCONTRACTOR MAY HAVE BY LAW OR BY PROVISIONS OF THE CONTRACT DOCUMENTS.
- ALL MATERIALS, EQUIPMENT AND WORK FURNISHED UNDER THIS SECTION SHALL BE GUARANTEED AGAINST ALL DEFECTS IN MATERIALS AND WORKMANSHIP FOR A MINIMUM PERIOD OF ONE YEAR COMMENCING WITH THE DATE OF SUBSTANTIAL COMPLETION. WHERE INDIVIDUAL EQUIPMENT SECTIONS SPECIFY LONGER WARRANTIES, PROVIDE THE LONGER WARRANTY. ANY FAILURE DUE TO DEFECTIVE MATERIAL, EQUIPMENT OR WORKMANSHIP WHICH MAY DEVELOP, SHALL BE CORRECTED AT NO EXPENSE TO THE OWNER INCLUDING ALL DAMAGE TO AREAS, MATERIALS AND OTHER SYSTEMS RESULTING FROM SUCH FAILURES.

## INTERPRETATION OF DRAWINGS AND SPECIFICATIONS

- IT IS THE INTENTION OF THE SPECIFICATIONS AND DRAWINGS TO CALL FOR COMPLETE, FINISHED WORK, TESTED AND READY FOR CONTINUOUS OPERATION. ANY APPARATUS, APPLIANCE, MATERIAL OR WORK NOT SHOWN ON THE DRAWINGS, BUT MENTIONED IN THE SPECIFICATIONS OR VICE VERSA, OR ANY INCIDENTAL ACCESSORIES NECESSARY TO MAKE THE WORK COMPLETE IN ALL RESPECTS AND READY FOR OPERATION, EVEN IF NOT PARTICULARLY SPECIFIED, SHALL BE PROVIDED BY THE CONTRACTOR OR HIS/HER SUB-SUBCONTRACTORS, WITHOUT ADDITIONAL EXPENSE TO THE OWNER.
- THE DRAWINGS ARE GENERALLY DIAGRAMMATIC. THE LOCATIONS OF ALL ITEMS THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS MUST BE DETERMINED AT THE SITE AND SHALL HAVE THE APPROVAL OF THE ARCHITECT BEFORE BEING INSTALLED. THE HVAC CONTRACTOR SHALL FOLLOW DRAWINGS, INCLUDING SHOP DRAWINGS, IN LAYING OUT WORK AND SHALL CHECK THE DRAWINGS OF OTHER TRADES TO VERIFY SPACES IN WHICH WORK WILL BE INSTALLED. MAINTAIN MAXIMUM HEADROOM AND SPACE CONDITIONS. WHERE SPACE CONDITIONS APPEAR INADEQUATE, NOTIFY THE ARCHITECT BEFORE PROCEEDING WITH THE INSTALLATION. THE HVAC CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE REASONABLE MODIFICATIONS IN THE LAYOUT AS NEEDED TO PREVENT CONFLICT WITH WORK OF OTHER TRADES OR FOR PROPER EXECUTION OF THE WORK.
- SIZES OF DUCTS AND PIPES AND ROUTING ARE SHOWN, BUT IT IS NOT INTENDED TO SHOW EVERY OFFSET AND FITTING, NOR EVERY STRUCTURAL DIFFICULTY THAT MAY BE ENCOUNTERED. TO CARRY OUT THE INTENT AND PURPOSE OF THE DRAWINGS, ALL NECESSARY PARTS TO MAKE COMPLETE APPROVED WORKING SYSTEMS READY FOR USE, SHALL BE FURNISHED WITHOUT EXTRA CHARGE.

## FIRE PROTECTION

- REWORK EXISTING SPRINKLER LAYOUT PER NFPA 13 REQUIREMENTS, LOCAL AHJ, AND OWNERS INSURANCE PROVIDER TO MATCH NEW CEILING GRID AND INTERIOR PARTITION LAYOUTS (SEE ARCHITECTURAL DRAWINGS FOR NEW CEILING AND PARTITION LAYOUTS).
- MODIFY AND REWORK EXISTING SPRINKLER SYSTEMS TO AVOID CONFLICTS WITH HVAC, CEILING HEIGHT AND OTHER NEW INSTALLATIONS.
- THIS RENOVATION WORK WILL TAKE PLACE IN BUILDING. COORDINATE ANY SYSTEM IMPAIRMENTS WITH BUILDING OWNER. BEFORE SHUTTING OFF SECTION OF THE SPRINKLER SYSTEM TO MAKE SPRINKLER TIE-INS, NOTIFY THE LOCAL FIRE DEPARTMENT, PLAN THE WORK CAREFULLY AND ASSEMBLE ALL MATERIALS TO ENABLE COMPLETION IN THE SHORTEST TIME POSSIBLE. WORK STARTED ON CONNECTIONS SHOULD BE COMPLETED WITHOUT INTERRUPTION AND PROTECTION RESTORED AS PROMPTLY AS POSSIBLE. DURING THE IMPAIRMENT, PROVIDE EMERGENCY HOSE EXTINGUISHERS AND MAINTAIN EXTRA WATCH SERVICE IN THE AFFECTED AREAS.
- FIRE SPRINKLERS: QUICK RESPONSE, SPRINKLERS THROUGHOUT.
  - STORAGE ROOMS OR ROOMS WITHOUT CEILING: UPRIGHT OR PENDANT WITH SPRINKLER GUARDS FOR SPRINKLERS SUBJECT TO MECHANICAL DAMAGE, BRASS FINISH
  - ROOMS WITH HARD DRYWALL CEILINGS: CONCEALED TYPE SPRINKLERS, WHITE FINISH
  - ROOMS WITH SUSPENDED CEILINGS: SEMI-RECESSED PENDENT WITH WHITE FINISH.
  - PROVIDE SPRINKLERS WITH TEMPERATURE RATINGS IN ACCORDANCE WITH NFPA 13.
- SYSTEM COMPONENTS TO BE UL LISTED AND FM APPROVED.
- ABOVE GRADE SPRINKLER PIPING (SPK)
  - PIPING 1-1/2-INCH AND SMALLER: SCHEDULE 40 STEEL WITH THREADED IRON FITTINGS.
  - PIPING 2-INCH AND LARGER: SCHEDULE 10 STEEL WITH GROOVED FITTINGS.
- SEAL INTERIOR PIPE PENETRATIONS WITH FIRE SEALANT. SEAL EXTERIOR WALL PIPE PENETRATIONS WATER TIGHT.
- PROVIDE SUPPORTS PER NFPA 13.
- PROVIDE RECORD DRAWINGS TO THE OWNER UPON COMPLETION OF THE WORK.
- SPRINKLER SYSTEM TO BE INSTALLED BY A STATE CERTIFIED FIRE PROTECTION CONTRACTOR.

## DUCTWORK

- GALVANIZED STEEL DUCTWORK: ASTM A653 GALVANIZED STEEL SHEETS, LOCK FORMING QUALITY, G90 ZINC COATING.
- FLEXIBLE DUCTWORK: UL 181 CLASS 1 AIR DUCT, INSULATED, ATCO, OR APPROVED EQUAL. FLEXIBLE DUCTWORK INNER CORE SHALL CONSIST OF A DOUBLE LAMINATION OF POLYESTER ENCAPSULATING A STEEL WIRE HELIX.
- ALL DUCTWORK SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH SMACNA STANDARDS. SEAL ALL DUCT JOINTS AND SEAMS (CLASS "A", 2 INCH PRESSURE CLASS).
  - DUCT SEALANT SHALL BE HARDCAST, INC. "IRON GRIP", WATER-BASED, VINYL ACRYLIC SEALANT.
- INSTALL DIFFUSERS TO DUCTWORK WITH AIRTIGHT CONNECTION. SEAL GAPS BETWEEN SURFACE MOUNTED AIR INLETS AND OUTLETS AIRTIGHT.
- INSULATE SUPPLY AIR DUCTWORK WITH 1-1/2" THICK FIBERGLASS INSULATION BLANKET W/VAPOR BARRIER, 25 FLAME SPREAD, 50 SMOKE DEVELOPED.
- PROVIDE DUCT ACCESS DOORS AT ALL COMPONENTS THAT REQUIRE SERVICING; INCLUDING BUT NOT LIMITED TO CONTROL DAMPERS TEMPERATURE CONTROL DEVICES, AND FIRE DAMPERS. PROVIDE SHEET-ROCK CEILING ACCESS PANELS WHERE REQUIRED.

## REGISTERS & DIFFUSERS (SEE SCHEDULE ON PLANS)

- SUPPLY DIFFUSERS: PRICE MODEL SPD, SQUARE PLAQUE DIFFUSER.
- EXHAUST GRILLES: PRICE MODEL 535, GRILL WITH 1/2" SPACING LOUVERED FACE, WHITE FINISH.
- RETURN GRILLES: PRICE MODEL 535, GRILL WITH 1/2" SPACING LOUVERED FACE, WHITE FINISH.
- PROVIDE DAMPERS IN BRANCH DUCTWORK FOR ALL REGISTERS AND DIFFUSERS.

## SERIES FAN-POWERED TERMINAL UNITS (SEE SCHEDULE ON PLANS)

- CASING: SHALL BE MINIMUM 22 GAUGE GALVANIZED STEEL, ABLE TO WITHSTAND 125 HOUR SALT SPRAY TEST PER ASTM B-117.
- CASING LINING: 1-INCH THICK, COATED, FIBROUS-GLASS DUCT LINER COMPLYING WITH ASTM C 1071; SECURED WITH ADHESIVE, COVER LINER WITH NONPOROUS FOIL.
- PRIMARY AIR VALVE: 18-GAGE GALVANIZED STEEL WITH PERIPHERAL GASKET AND SELF-LUBRICATING BEARINGS.
- AIR FILTER: 1-INCH THICK, PLEATED MEDIA.
- FAN: FAN-MOTOR ASSEMBLY SHALL BE FORWARD-CURVED CENTRIFUGAL FAN WITH A DIRECT DRIVE ECM MOTOR.
- ELECTRIC HEATING COIL: PROPORTIONAL, MODULATING ELECTRIC COILS SHALL BE FACTORY INSTALLED. SEE VAV SCHEDULE FOR HEATING COIL PERFORMANCE REQUIREMENTS. ELECTRIC COILS SHALL CONTAIN A PRIMARY AUTOMATIC RESET THERMAL CUTOFF, A SECONDARY REPLACEABLE HEAT LIMITER PER ELEMENT AND PROPORTIONAL ELECTRONIC AIRFLOW SWITCH. HEATERS SHALL BE EQUIPPED WITH A PROPORTIONAL SCR CONTROLLER TO MODULATE HEATING LOAD ACCORDING TO TEMPERATURE CONTROL SIGNAL.
- DDC CONTROLS: DDC ACTUATOR WITH 24 VOLT CONTROL VOLTAGE. COMMUNICATION WITH TEMPERATURE-CONTROL SYSTEM VIA A CENTRAL CONTROL PANEL.

## AUTOMATIC TEMPERATURE CONTROLS

- ALL CONTROLS SHALL BE DDC. PROVIDE ALL COMPONENTS NECESSARY TO PROVIDE A COMPLETE NETWORK OF COMMUNICATION BETWEEN HVAC EQUIPMENT AND INPUT/OUTPUT MODULES TO CONTROL A FULL ARRAY OF ANCILLARY DEVICES AND SENSORS.
- START AND COMMISSION SYSTEMS. PROVIDE ALL REQUIRED SOFTWARE MODIFICATIONS AND DE-BUGGING. ALLOW SUFFICIENT TIME FOR START-UP AND COMMISSIONING PRIOR TO PLACING CONTROL SYSTEMS IN PERMANENT OPERATION. ALLOW FOR COORDINATION WITH THE TESTING, ADJUSTING, AND BALANCING CONTRACTOR. ASSISTANCE SHALL BE PROVIDED AS REQUIRED FOR REPROGRAMMING, COORDINATION, AND PROBLEM RESOLUTION.
- THERMOSTAT: ZONE THERMOSTAT SHALL BE A SENSOR WITH THUMBWHEEL SETPOINT ADJUSTMENT, NIGHT SETBACK OVERRIDE AND CANCEL BUTTONS, AND A COMMUNICATIONS JACK.
- CONTROLS TESTING SHALL BE ACCOMPLISHED ON EACH CONTROL DEVICE. ACTUATORS SHOULD BE CHECKED AND ADJUSTED FOR START AND EXTENT OF TRAVEL. ALL RELAYS AND ADAPTERS SHOULD BE CHECKED SHOULD FOR PROPER OPERATION. CONTROLLERS SHOULD BE CHECKED FOR PROPER ACTION. ALL SYSTEM INTERLOCKS, INTERCONNECTIONS, AND SAFETY DEVICES SHOULD BE CHECKED FOR PROPER FUNCTION.
- ALL CONTROL DEVICES SHALL BE ADJUSTED AND CALIBRATED. ALL CONTROL SETTINGS SHOULD BE VERIFIED BY COMPARING ACTUAL INPUT AND OUTPUT VALUES TO CALIBRATED VALUES.
- FURNISH ALL COMPONENTS AS REQUIRED FOR COMPLETE AND FUNCTIONING SYSTEM. PROVIDE DDC CONTROL WITH FULLY MODULATING ACTUATORS.
- COORDINATE SENSOR LOCATIONS.
- ALL POINTS SHALL BE INTERFACED AND CONNECTED TO THE HOST WORKSTATION.

## MECHANICAL INSULATION

- ALL SUPPLY DUCTS SHALL BE EXTERNALLY INSULATED WITH FIBERGLASS DUCT WRAP EQUAL TO JOHNS MANVILLE MICROLITE TYPE 75, ASTM C533, NONCOMBUSTIBLE BLANKET, 1-1/2" THICK.

## TESTING, ADJUSTING, AND BALANCING (T-A-B)

- TEST, ADJUST, AND BALANCE EQUIPMENT AND DISTRIBUTION SYSTEMS IN ACCORDANCE WITH NEBB OR AABC PROCEDURAL STANDARDS. TESTS SHALL BE PERFORMED BY AN INDEPENDENT T-A-B AGENCY.
- T-A-B ALL NEW AND REVISED AIR INLETS AND OUTLETS, INCLUDING DESIGN AND ACTUAL CFM. TEST AND ADJUST ADJACENT AFFECTED AREAS IF REQUIRED.
- T-A-B ALL NEW VAV BOXES AS INDICATED IN THE AREA OF WORK: INCLUDE TAG, MANUFACTURER AND MODEL, SIZE, MINIMUM STATIC PRESSURE, MINIMUM DESIGN AIRFLOW, MAXIMUM DESIGN AIRFLOW, MAXIMUM ACTUAL AIRFLOW, AND INLET STATIC PRESSURE.
- THE TAB AGENCY SHALL ASSIST THE BUILDING CONTROL SYSTEMS CONTRACTOR IN VERIFYING THE OPERATION AND CALIBRATION OF ALL HVAC AND TEMPERATURE CONTROL SYSTEMS.

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